Séminaire de physique mathématique

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Orme des Merisiers Pièce 35, Bât. 774

New critical phenomena in the constrained random networks

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We discuss new phenomena in the Erdos-Renyi networks supplemented by the degree conservation constraint and in regular random graphs. The key tool is the analysis of spectral properties of adjacency and Laplacinan matrices in particular the phenomena of eigenvalue tunneling. When the chemical potential for the triangles is introduced the networks undergo the complete defragmetration into the maximally possible number of cliques generalizing the Strauss phase. If the chemical potentials for the unicolor trimers are introduced in the multicolor constrained networks it turns out that they are absolutely unstable with respect to fragmetration into the weakly coupled multilayer networks. The phenomena of the finite plateau formation for the network spectral gap occurs at some interval of chemical potentials for trimers. The localization-delocalization transition in the constrained networks will be explained.